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ABSTRACT

This paper reviews findings from two years of evaluation of Intel[R] Teach to the Future, a professional development program focused on improving classroom technology integration. Intel[R] Teach to the Future is a 3-year, international effort supported by the Intel[R] Corporation. The program uses a train-the-trainer model to deliver a curriculum that emphasizes using commonly available software tools to support students in conducting original inquiries and creating multiple representations of what they learn. The Center for Children and Technology, part of Education Development Center, Inc., is conducting an external evaluation of Intel[R] Teach to the Future. The first year of the evaluation investigated teacher responses to the training, and strengths and weaknesses of the program delivery model as a mechanism for achieving both broad implementation and locally meaningful and sustained impact. Year Two research uses case studies to investigate the sustained impact of the program on teachers' instructional practices. (Author)

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Selected Findings from the Evaluation of Intel® Teach to the Future

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Key words: professional development, technology

Abstract
This paper reviews findings from two years of evaluation of Intel Teach to the Future, a professional development program focused on improving classroom technology integration. Intel Teach to the Future is a three-year, international effort supported by the Intel Corporation. The program uses a train-the-trainer model to deliver a curriculum that emphasizes using commonly available software tools to support students in conducting original inquiries and creating multiple representations of what they learn.

The Center for Children and Technology, part of Education Development Center, Inc., is conducting an external evaluation of Intel Teach to the Future. The first year of the evaluation investigated teacher responses to the training, and strengths and weaknesses of the program delivery model as a mechanism for achieving both broad implementation and locally meaningful and sustained impact. Year Two research uses case studies to investigate the sustained impact of the program on teachers' instructional practices.

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Introduction

This paper reviews selected findings from an evaluation of the Intel Teach to the Future professional development program. Intel Teach to the Future was designed to address the overarching goal of the Intel Innovation in Education initiatives: to improve math, science, technology and engineering education worldwide. To achieve this end, the program focuses on two of the four more specific goals of the Innovation in Education initiatives: promoting the effective use of technology in the classroom, and improving science and math education in K-12 schools. Our evaluation focuses on the U.S. implementation of this international program. The, first year of the evaluation (2000-2001) focused primarily on understanding the extent to which the program may be meeting the first of its goals: promoting the effective use of technology in the classroom. Methods employed included surveys, site visits to participating school districts, and interviews with teachers, program staff, and district personnel. During the second year of the evaluation, we are conducting case studies in several districts to investigate both of the goals.

The evaluation examines the challenges of disseminating a challenging, high-quality curriculum to a broad (both geographically dispersed and diverse in their teaching specialties) population of teachers. A range of research has demonstrated the importance of local ownership of educational innovations to their long-term effectiveness (McLoughlin, 1978; Sabelli & Dede, forthcoming) On the other hand, the need to identify promising programs and practices and bring them to scale is great. Can a highly structured delivery model, a train-the-trainer approach, and a well designed and extensively piloted curriculum cause meaningful impact at the classroom level for teachers across the country teaching in widely varying circumstances? To help answer this question, we have paid careful attention to two key topics in our evaluation: the efficacy of the implementation model of Intel Teach to the Future, and initial evidence of the impact of the program on teachers who have participated in the program.

We understand "efficacy" here to refer not just to a smooth implementation of Intel's prescribed sequence of trainings, but to a more site-specific ideal of program effectiveness. Because we know that large-scale educational innovations have the most lasting impact when they allow for local adaptation and tailoring of the innovation (Culp & Honey, 2001; Culp, Honey, & Spielvogel, forthcoming; Fishman, Best, Foster & Marx, 2000), we looked to see whether this program was being adapted to meet local needs; whether the local adaptations improved the delivery and impact of the program; and whether the administrative structures of the program supported that process of local adaptation.

To learn more about the content and structure of Intel Teach to the Future, visit http://www.intel.com/education.

Findings

Demographic Profile of Teachers

This summary is based on data collected as of June 2001, but subsequent analyses as the pool of participants has grown indicate that the overall profile of the population is remaining consistent.

Most teachers who responded to end-of-training surveys were women (80%, N=6385). The sample was also predominantly White/non-Hispanic (84%, N=6713). Hispanic or Latino(a) teachers constituted 8% of the training survey sample (N=663), while less than five percent of the sample was Black/non-Hispanic (3%, N=268) or Asian (2%, N=141). This distribution includes more Hispanic teachers than the U.S. teaching population as a whole: the national profile is 90.7% White/non-Hispanic, 7.3% Black/non-Hispanic, and 2.0% other racial/ethnic groups (U.S. Department of Education, National Center for Education Statistics, 2001).

Survey participants varied widely in the extent of their teaching experience. Some of

those receiving training were just beginning their teaching careers, while others reported almost 50 years of teaching experience. These teachers have an average of 13 years of teaching experience (SD=9). Most teachers (64%, N=5103) reported that less than 50% of the students in their schools were eligible for reduced or free lunch, which is consistent with the national range (68% of schools nationwide have less than half of their students eligible for reduced price/free lunch).

The greatest plurality of teachers who completed end-of-training surveys were Generalists (these are primarily elementary school teachers who address all subjects), who accounted for 27% of respondents to the end-of-training survey. These teachers and Language Arts/English teachers (19% of respondents) accounted for a near-majority of program participants, while all other teaching categories lagged significantly behind (e.g. Math – 7.7%; Science – 6.8%; ESL – 5.4%). About one-third (32%) of these teachers work in the early elementary grades (K-3); 16% teach upper elementary (grades 4-5), one-quarter teach middle school (grades 6-8), and 27% teach in high schools (grades 9-12).

Responses to the Program

Teachers reported their responses to the program through surveys conducted at the end of every Master and Participant Teacher training, as well as in interviews with the evaluation team. Teachers consistently reported a very high level of satisfaction with the training.

In their responses to the end-of-training survey, Participant Teachers were very positive about their experiences with Intel Teach to the Future.

- 97% of teachers participating in Intel Teach to the Future trainings reported that the ideas and skills they learned through the program would help them to successfully integrate technology into their students' activities.
- 94% of these teachers said that they would "definitely" recommend the Intel Teach to the Future training to a friend or colleague.
- 91% of these teachers reported that after completing their training, they felt "well prepared" to integrate educational technology into the grade or subject they teach.
- 91% of these teachers felt "well prepared" to support their students in using technology in their schoolwork.
- 90% of these teachers felt "well prepared" to evaluate the technology-based work their students produce.
- 76% of these teachers felt that their trainer was "very effective" in facilitating their training experience.

When asked to rate the helpfulness of various forms of professional development, participants tended to rate Intel Teach to the Future more positively than other forms professional development they had experienced in the past year. Eighty-six percent of participants surveyed felt that the Intel training was "somewhat" (33%) or "very" (55%) useful to them as they worked on improving their use of technology.

In interviews, LEA coordinators expressed satisfaction with the program thus far and offered rich anecdotal evidence that their teachers are pleased with the training. When asked if he had received any feedback from Master and Participant Teachers about the curriculum, a typical LEA coordinator replied:

> "I met with their principals the other day to see what the general reception has been on the campus, and the feedback has been excellent, excellent. The

principals said that exciting things are happening with those students [of Participant and Master teachers]."

Program Impact on Participating Teachers and Their Classrooms

Initial Evidence of Program Impact

As we noted above, one of the factors we used to determine the efficacy of the program was the extent to which teachers implemented the unit plans they created in the trainings. In the end-of-year survey 51% of the respondents reported that they had implemented their unit plan they developed in their Intel Teach to the Future training (this includes 78% of Master Teachers and 48% of Participant Teachers). Over half of those teachers who implemented a unit plan reported being "very satisfied" with the experience (53%), and three-quarters were at least "somewhat satisfied"(33%).

Teachers who had implemented their unit plans felt very strongly that their unit had been effective in helping them to meet their learning goals for their students. Specifically:

- 80% reported "student projects showed more in-depth understanding" than other, comparable work.
- 89% reported "student projects were more creative" than other, comparable work.
- 99% reported students were "motivated and involved in the lesson."
- 97% said they "received positive student feedback," on the unit.

Reasons for not implementing the unit plan

Over 75% of those who had not implemented their unit plan expected to do so in the next school year. The most common reasons for not implementing a unit plan were that the plan was created too late in the school year to be used (38.6%) or that the teacher planned to use the lesson later in the school year (19.7%).

Obstacles to effective unit plan implementation included not having enough time to complete the entire lesson (42% agreed or strongly agreed), and not having enough computers available (47% agreed or strongly agreed). Teachers surveyed did not generally feel that their students' or their own computer skills were an obstacle to implementation, or that they had technical problems that kept them from implementing the unit.

In addition to time constraints, prominent obstacles to unit plan implementation included the following:

- Technology access. Teachers who implemented their unit plans averaged significantly more computers in their classrooms (7.42) than those who did not (4.77). This is consistent with other research that has shown that a 1-to-4 ratio of computers to students is critical to support gains in the quality of students' use of technology (Becker, 2000). Teachers who implemented unit plans were also significantly more likely to have at least some of their classroom computers connected to the Internet than those teachers who did not implement their units.
- Time constraints. When teachers explained that they did not have enough time to make full use of their unit plans, they were referring to several different issues.
  - the amount of class time that would be required to cover a full unit.
  - getting their students adequate time on computers.
  - finding time for themselves to do further curriculum development to improve or complete their unit plan.
- Testing pressures. Teachers who did not implement unit plans were more likely than those who did to report that standardized testing has changed how and what they teach. Teachers

often referenced the project-oriented nature of the Intel Teach to the Future curriculum, and said that there is little opportunity to do this sort of open-ended and student-directed teaching when test preparation is a high priority in their school or district.

- Applicability of the unit plan. Teachers who did not implement their unit plans frequently described what they perceived to be a poor fit between the program's emphasis on student use of the technology and inquiry- and research-oriented projects, and their own existing curriculum and learning goals. Early elementary grade teachers, who were slightly less likely than teachers at other grade levels to implement a unit plan, made these comments most often.

  Among those early elementary teachers who did implement unit plans, it is evident that many modified those units to suit their perceptions of what would work for their students. These teachers were the least likely group to have their students actually use any of the relevant software in the course of teaching their unit. Instead, these teachers used the software themselves to, for example, create a PowerPoint presentation for the class.

Intel Teach to the Future as a Catalyst for Change

LEA liaisons and other district- and school-level administrators viewed participation in Intel Teach to the Future as both a major opportunity and a major challenge. This section of this paper reviews several areas in which program participation was often difficult, but ultimately productive for school districts.

Hardware Allocation

Participation in Intel Teach to the Future challenged districts to re-think their policies on technology distribution, and motivated teachers to push for better technology resources in their classrooms. The essential issue generating change was Participant Teachers' expectation that they would have a computer in their classroom once they completed their training, and more importantly, their desire to have that computer, and often their decision to push for more than one. These new levels of motivation often clashed with existing district-level planning. One frustrated school technology coordinator exclaimed, the "Intel Teach program is upsetting the district's plan for hardware allocation." He related that the district hardware rollout was supposed to proceed on a specific schedule. The elementary schools were supposed to be the last to get computers, yet many Intel Teach to the Future participants were from the elementary schools, and were pushing to get moved up on the allocation schedule.

In another district, the program had an opposite effect: teachers had already been promised computers for their classrooms without any expectation regarding training, but once they signed up for Intel Teach to the Future, they had to "earn" their hardware by completing the course, causing tension between Participant Teachers and the Master Teacher they perceived as withholding their hardware. One LEA liaison, who was relying on Intel Teach to the Future to provide basic technology training to the teachers in her small district, explained that although she was enthusiastic about the emphasis Intel Teach to the Future placed on student use of computers, it conflicted with her district's policy of placing only one computer in every classroom and reserving it exclusively for teacher use. The LEA liaison reflected, "I had to ask myself, 'what can I do to meet Intel's needs and live within the administration's restrictions?'"

Accessing Participant Teacher work outside class

Across all districts, LEAs and MTs had to figure out how to help Participant Teachers access their work from locations other than the labs where classes were being held. In many districts, this was the first time that teachers had asked to have this kind of access to online resources, and

the needs raised by this training caused new policies or new resources to be put in place that, if they are institutionalized, will improve the functionality and quality of school networks for all teachers in these districts.

Cross-platform issues

Intel Teach to the Future's exclusive focus on PC computer platforms raises issues for teachers who use Apple computers in their classrooms. This challenge is particularly prominent because Apple computers are most commonly used in early elementary classrooms, and early elementary teachers (K-3) constitute almost one-third of the teachers participating in the program.

In some districts, teachers dedicated to using Macintoshes simply did not participate in Intel Teach to the Future (this contributed to recruitment challenges in some districts, as K-6 teachers are the majority of the classroom-based teaching staff in K-12 districts). As one LEA liaison said, "I could [recruit enough teachers for my training] if elementary school teachers had the equipment, which they don't. Of course they are the majority of the teachers in the district."

However, some Macintosh-using elementary grade teachers have been able to bridge the gap and apply the Intel Teach to the Future curriculum in their Macintosh-based classrooms. While they are obviously unable to follow the curriculum to the letter, they are able to use the same software packages used in the curriculum. A challenge to this approach is gaining access to copies of Microsoft Office for Macintosh, since the program does not provide it and it may be too expensive for the district to buy. Some teachers simply plan to apply the general lessons of the curriculum to other applications they already use with their students. These teachers are able to think beyond the technical issues involved in the training and to focus on the larger principles being communicated by the Intel Teach to the Future curriculum.

Concluding analysis

The vast majority of Participant Teachers we spoke with saw Intel Teach to the Future through the lens of their pre-existing perceptions of and experiences with their district administration and their previous professional development experiences. In many cases, this was beneficial – teachers with positive relationships with their districts took it on faith that the program had been chosen with an eye to their needs. However, when Participant Teachers had reason to be doubtful about the usefulness of training sponsored by their district, or about their district's ability to support them in making use of what they learned in professional development sessions, it was difficult for even the most skilled Master Teacher to make the Intel Teach to the Future a highly valued experience.

Different districts provide different sets of preconditions for teachers' reception of Intel Teach to the Future which have a real and tangible impact on what teachers take away from the training and, in turn, on what impact the training has on their teaching and their students' learning. Optimally, Intel Teach to the Future can act as a catalyst for positive change, encouraging administrators and teachers to re-examine their practices, policies or beliefs about technology use, and moving the entire district toward better access, more interesting ideas about student use of technology, and more collaboration and innovation by the teaching staff.

Across all contexts, a vital element was effective communication – between RTAs and districts, between administrators and teachers, and among teachers – about the scope and purpose of this training beyond earning computers or fulfilling professional development obligations. Especially in districts where constructive professional development opportunities are rare or where technology resources are scarce, it is crucial that teachers be invited to use Intel Teach to the Future as a chance to identify their own teaching goals, to reflect on their learning goals for their students, and to exploit the concrete curricular benefits of using technology in the

classroom.

Discussion of Year One Findings

What does it take to create a school in which students are frequent, comfortable users of technology tools, and teachers are able to make clearly considered connections between learning goals and the technologies they ask their students to use? Hank Becker (2000) suggests that no one factor can create this situation. His research indicates that a majority of teachers in a community will begin to use technology with their students for more than remediation, skill-building, or recreation only when adequate technical skill, a generally constructivist teaching philosophy, and convenient access to a cluster of at least five to eight computers are available in teachers' classrooms. Intel Teach to the Future seeks to help teachers build their technical skills, while also inviting them to pursue a more student-centered, research-oriented mode of teaching. The curriculum presents convincing images of how commonly available software tools can support this kind of learning. This bridging of technical training with opportunities to reflect on and practice student-centered, content-rich applications of technology tools is the key quality of this program. Its eventual impact on everyday teaching and learning depends on effectively moving teachers from understanding "technology" as a set of technical skills to master toward seeing various applications as distinct tools to support engaged and creative student learning.

Our research suggests that teachers who have participated in this program are extremely enthusiastic about the experience and have a high opinion of both their trainers and the curriculum. However, as this report has outlined, two major factors stand between the quality of the program and its ability to realize its intended impact at the classroom level. First, teachers' pre-existing beliefs and practices influence their engagement with the core concepts of the curriculum. Second, school- and district-level factors frequently militate against the kind of experimentation and innovation that teachers need permission to pursue if they are to build, over time, a real mastery with the technology and the kind of teaching and learning valued by this program.

Preliminary Findings from Year Two Case Study Research

Case studies being conducted in four school districts during the 2001-2002 school year are suggesting that Intel Teach to the Future can have a sustained impact on the character and quality of technology use in schools, and in science classrooms in particular. We are finding that many of the issues raised in our Year One findings continue to be prominent issues in the districts we are following this year. In our case study sites, raised teacher awareness and enthusiasm about using technology with students in instructionally rich ways is being sustained over time, and is creating a "push" on existing administrative and technical structures that have impeded teachers' ability to use technology well with their students. Intel Teach to the Future seems not only stimulate teachers to reshape their goals for technology use, but to stimulate changes in their environment that make it more possible for them to pursue and achieve these goals.

We conclude this report by briefly summarizing some of the issues we are following across our case study sites that illustrate this phenomenon.

<u>Common Goals in Schools with a Master Teacher and Many Participant Teachers</u>

Master Teachers frequently recruit many teachers from their own school to participate in Intel Teach to the Future. In these schools, where a large cohort of trained teachers has been established and a Master Teacher is providing leadership and sustained support, we are seeing

evidence of teachers beginning to act as a coordinated group, focused on similar goals for technology use. Examples of this kind of behavior include:

- Teachers pooling resources (including computers and instructional space) to make it possible for whole classes of students to work on the computers at once.
- Teachers making informed, shared decisions about technology policies in their schools, such as deciding what kinds of equipment they want to purchase for their grade levels/departments.
- Master Teachers seeking out teachers' feedback to inform purchasing and allocation decisions.

This kind of behavior is important because it suggests that these teachers are creating a distinctive social context for technology use in their schools. Rather than being a marginalized activity that most teachers do not engage with, instructionally-focused technology use is becoming one of the central, shared activities of the school as a whole. Further, teachers' goals for technology use are aligned with one another, and draw on a common vision of meaningful use of technology with students.

Shifts in Teachers' Instructional Strategies and Assessment Practices

We are seeing some evidence in our case study sites that teachers are beginning to place an increased emphasis on supporting and evaluating their students' work process, rather than focusing on the creation of finished products. For example, several teachers are re-designing lesson plans to help students set clear, content-focused priorities for their work process, such as completing content research before spending time on the design of a PowerPoint presentation. These shifts seem to arise initially as a response to the limited availability of both computers and time, which students need in order to engage in sustained research projects. The consequence of these shifts, though, can be an instructional environment that encourages students to focus on sustained inquiry and effective communication, rather than on more superficial aspects of the research process.

Teachers also seem to be making greater use of assessment rubrics after participating in Intel Teach to the Future. The training introduces rubrics as a way to articulate expectations for complex student work products and to evaluate students' accomplishments. Teachers are reporting that the experience of creating a rubric during their training helped them overcome their hesitations about using rubrics, and are finding that these tools provide a useful structure for assessing work products they are not entirely familiar with, such as student web pages and PowerPoint presentations.

These two findings suggest that Intel Teach to the Future can, with certain follow-up supports in place, have a lasting impact not only on the level of teachers' technology use, but in the quality of their instructional and assessment practices.

Impact of the Training Model on Other Professional Development

The approach and structure of the Intel Teach to the Future curriculum is also having an impact on districts' overall approach to professional development. For example, in one of our case study sites, the head of the district educational technology department has re-designed the district's Summer Institute for technology training. The Institute used to focus on building teachers' skills with various software programs. She describes this summer's redesigned institute in this way:

> "This year it's: 'Come and let's see where you are in your curriculum and in your standards-based use of technology, and let's see how we can help you use the

> *appropriate* technology to help you move forward in your use of technology.' I'm sure the Intel program was not the sole reason [for this change], but it really heightened our awareness and showed us that the emphasis needs to be on the curriculum, not just on the technology."

In another of our case study sites, teachers who have become Intel Teach to the Future Master Teachers are no longer willing to teach skill-building technology workshops that they used to lead for their district. They want to re-design the in-service technology training sessions their district offers throughout the school year to give the trainings a clear purpose that ties back to teachers' immediate classroom activities. These Master Teachers are hoping to influence district personnel to cause these kinds of changes across the districts' whole technology professional development program.

Changes like these are important because they suggest that Intel Teach to the Future can have an impact on a school district that reaches beyond the individual teachers who participate in this particular training program. Intel Teach to the Future models how technology-related professional development can maintain a core focus on curriculum and instructional issues, and can invite teachers to re-examine and re-design a portion of their curriculum. In districts with personnel in place who are able and willing to build on this model, it is possible for broad shifts to take place, refocusing the whole structure of technology-related professional development so that curriculum and instructional issues become central to the district's vision of technology use.

References

Becker, H., (2000). Findings from the Teaching, Learning and Computing Survey: Is Larry Cuban Right? Revision of a paper written for the School Technology Leadership Conference of the Council of Chief State School Officers, Washington, DC, July, 2000. Report from the Center for Research on Information Technology and Organizations, University of California, Irvine.

Culp, K.M., & Honey, M. (2001). Scale and localization: The challenge of implementing what works. Briefing paper prepared for the Wingspread Conference on Technology's Role in Urban School Reform: Achieving Equity and Quality, sponsored by the Joyce Foundation, Education Development Center, and the Johnson Foundation. October 12-14, 2000. EDC Center for Children and Technology, New York.

Culp, K.M., Honey, M., & Spielvogel, B. (forthcoming). Local relevance and generalizability: Linking evaluation to school improvement. Paper commissioned by SRI, presented at Department of Education-sponsored SRI Design Meeting, The Effectiveness of Educational Technology: Research designs of the next decade. Palo Alto, CA, February 25—26, 2000. To appear in New Approaches to Evaluating the Impact of Educational Technology (Mean, B., and Haertel, G., Eds.). Teachers College Press: New York.

Fishman, B., Best, S., Foster, J., & Marx, R. (2000, April). Fostering teacher learning in systemic reform: A design proposal for developing professional development. Paper presented at the Annual Meeting of the National Association of Research in Science Teaching. New Orleans, LA.

McLaughlin, M. (1990). The RAND change agent study revisited: Macro perspectives and micro realities. Educational Researcher, (19)9, December, 1990.

Ravitz, J., Becker, H.J., and Wong, Y. (2000). Constructivist-compatible beliefs and practices among U.S. teachers. Teaching, Learning and Computing: 1998 National Survey, Report #4. Center for Research on Information Technology and Organizations, University of California, Irvine, and University of Minnesota.

Riel, M., & Becker, H. (2000). The beliefs, practices, and computer use of teacher leaders. Paper presented at the American Educational Research Association, New Orleans, April 26, 2000. www.crito.uci.edu/tlc.

Sabelli, Nora, & Chris Dede (in press). Integrating Educational Research and Practice: Reconceptualizing the Goals and Process of Research to Improve Educational Practice.

U.S. Department of Education, National Center for Education Statistics. Digest of Education Statistics, 2000. NCES 2000-034. by Thomas D. Snyder and Charlene M. Hoffman. Washington, DC: 2001. nces.ed.gov/pubsearch/index.asp.

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